

TILLSONBURG
water pollution
control plant

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ONTARIO WATER RESOURCES COMMISSION

801 BAY STREET, TORONTO 5

OFFICE OF THE GENERAL MANAGER

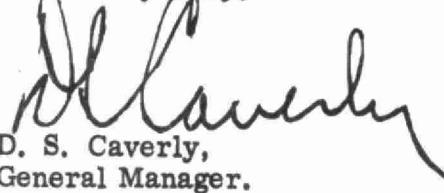
Members of the Tillsonburg Local Advisory Committee,
Town of Tillsonburg.

Gentlemen:

We are happy to present you with the 1967 Operating Summary for the
Tillsonburg Water Pollution Control Plant, OWRC Project No. 2-0012-58.

Your co-operation with our staff throughout the year has been appreciated.
Only with such co-operation can the war against water pollution be waged
effectively.

Yours very truly,


D. S. Caverly,
General Manager.

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ONTARIO WATER
RESOURCES COMMISSION



ONTARIO WATER RESOURCES COMMISSION

801 BAY STREET

TORONTO 5

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TELEPHONE 365-

D. S. CAVERLY
GENERAL MANAGER

W. S. MACDONNELL
COMMISSION SECRETARY

General Manager,
Ontario Water Resources Commission.

Dear Sir:

I am pleased to submit to you the 1967 Operating Summary for the Tillsonburg Water Pollution Control Plant, OWRC Project No. 2-0012-58.

The summary reviews progress during the year, outlines operating problems encountered and summarizes in graphs, charts and tables all significant flow and cost data.

Yours very truly,

A handwritten signature in black ink, appearing to read "McTavish".

D. A. McTavish, P. Eng.,
Director,
Division of Plant Operations.

FOREWORD

● This operating summary has been prepared in order to acquaint readers with the management of the project during 1967. The efficiency of the plant's operation is reflected in a general review. Significant financial details are recorded, and technical performance is illustrated by graphs and charts.

The summary should answer two salient questions. Are the project's facilities adequate at this time? And can the project meet future requirements?

The Regional Operations Engineer is primarily responsible for the preparation of the report, and will be pleased to answer any questions regarding it.

Most of the material for the graphs and charts was compiled by the statistics section of the Division of Plant Operations, with the final versions of the graphs being drawn by the draughting section of the Division of Sanitary Engineering. Cost data were provided by the Division of Finance.

It will be evident from the report that all of these groups co-operated with substantial success.

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**TILLSONBURG
water pollution control plant**

operated for

THE TOWN OF TILLSONBURG

by the

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Operations Engineer: R. E. Brown

801 Bay Street Toronto 5

'67 REVIEW

The average flow treated at the plant during the year was 760,000 gallons per day, which was 114% of the design capacity of 665,000 gpd. This represents a 4% increase in flow over 1966. During the peak month of January the average daily flow was 127% of the design capacity. An expansion of the treatment facilities at the plant is absolutely necessary. It is interesting to note that in 1964, the plant was overloaded 2% of the time; in 1965, 24% of the time; in 1966, 81% of the time, and in 1967, 97% of the time.

A raw sewage having an average strength of 317 ppm BOD and 263 ppm SS was treated. Fair removals were obtained by the plant resulting in a 92.3% reduction in BOD and an 88.2% reduction in SS. A total of 404.91 tons of BOD and 324.9 tons of SS was removed. A total of 890,000 cu. ft. of raw sludge was treated by the digester, and 147,000 cu. ft. of digested sludge was hauled by truck. An additional 31,500 cubic feet of raw sludge was hauled. Proper chlorination of the final effluent was maintained throughout the year.

Inspections of the structures and grounds showed that they were well maintained and in good condition. An electrical and mechanical inspection was made of the project equipment and no major deficiencies were discovered.

The operating cost for the year was \$32,326.18, an increase of approximately \$5,044.00 over the cost in 1966. The unit cost of treating one million gallons increased from \$102.30 in 1966 to \$116.56 in 1967 due to greatly increased flows, overloading of equipment and increased costs in general.

PROJECT STAFF

The Tillsonburg Water Pollution Control Plant has a staff of two, a Chief Operator and an operator, and is supervised eight hours a day during the week and three hours each on Saturday and Sunday. The staff alternates on weekends.

PROJECT COSTS

NET CAPITAL COST (Estimated)	
Long Term Debt to OWRC	\$ <u>608, 220. 09</u>
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1967	\$ <u>86, 657. 06</u>
Debt Retirement	\$ 12, 274. 00
Reserve	3, 008. 87
Interest Charged	34, 299. 60
Net Operating	32, 326. 18
TOTAL	\$ <u>81, 908. 65</u>
	<u>RESERVE ACCOUNT</u>
Balance at January 1, 1967	\$ 23, 005. 64
Deposited by Municipality	3, 008. 87
Interest Earned	<u>1, 368. 67</u>
\$ 27, 383. 18	
Less Expenditures	
Balance at December 31, 1967	\$ <u>27, 383. 18</u>

MONTHLY OPERATING COSTS

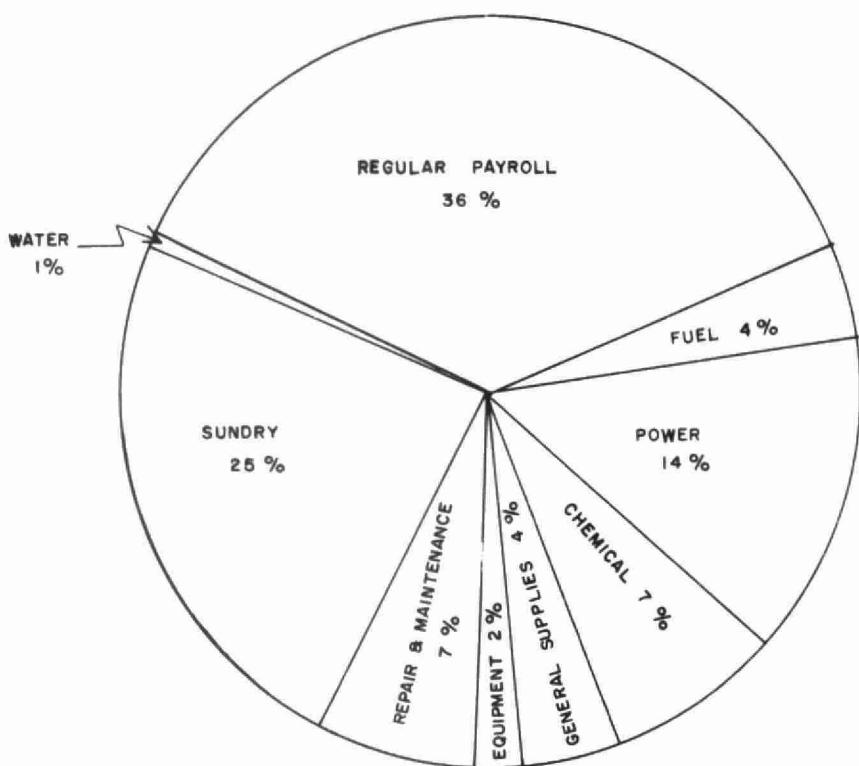
MONTH	TOTAL EXPENDITURE	PAYROLL	FUEL	POWER	CHEMICAL	GENERAL SUPPLIES	EQUIPMENT	REPAIRS & MAINTENANCE	* SUNDAY	WATER
JAN	2095.09	112.56	139.40			75.77	236.25	435.99	75.00	
FEB	1852.14	70.96		376.88	228.38	126.22		121.60	1.00	16.00
MARCH	2075.84	1496.40	273.24	387.60	15.65	147.65	125.34	272.00	1.00	16.00
APRIL	2246.67	187.01	270.70	395.02	228.38	100.76	145.92	400.68	405.92	16.00
MAY	2865.48	952.90		370.98	228.38	114.33	60.00	398.00	754.00	16.00
JUNE	2261.95	972.01	291.56	383.09	228.38	152.81		54.29	100.77	31.67
JULY	3297.85	902.75		393.52	228.38	151.63		220.45	1347.00	16.00
AUG	1352.87	350.62		402.06	228.38	101.29		67.31		16.00
SEPT	2362.87	1377.73		469.57	242.57	93.06		49.72	13.26	16.00
OCT	4157.50	913.00		477.40	662.30	77.31		43.42	1368.60	16.00
NOV	2745.68	917.89	261.60	443.26		66.35		26.25	1014.29	16.00
DEC	2591.09	902.93	139.50	420.89		153.73		303.76	564.26	16.00
TOTAL	32326.18	11763.99	1375.00	4594.89	2390.60	1369.00	557.56	2233.53	7353.25	191.07

* SUNDAY INCLUDES SLUDGE HAULING COSTS WHICH WERE .75, -.16.64 AND CANCELL CONTRACTS \$ - .70
BRACKETS INDICATE CREDIT

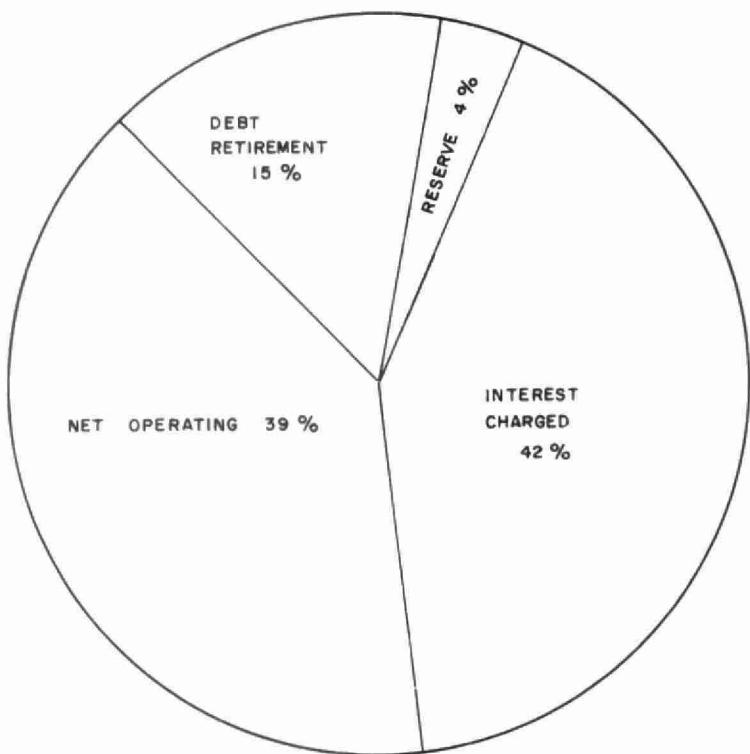
YEARLY OPERATING COSTS

YEAR	M.G. TREATED	TOTAL COST	COST PER MILLION GALLONS	COST PER LB. OF BOD REMOVED
1963	170,024	\$ 19753.04	\$ 114.20	5 CENTS
1964	187,461	21544.08	116.00	6 CENTS
1965	223,459	25142.33	112.49	6 CENTS
1966	260,673	27281.70	102.30	5 CENTS
1967	277,327	32326.18	116.56	4 CENTS

1967 OPERATING COSTS



TOTAL ANNUAL COST



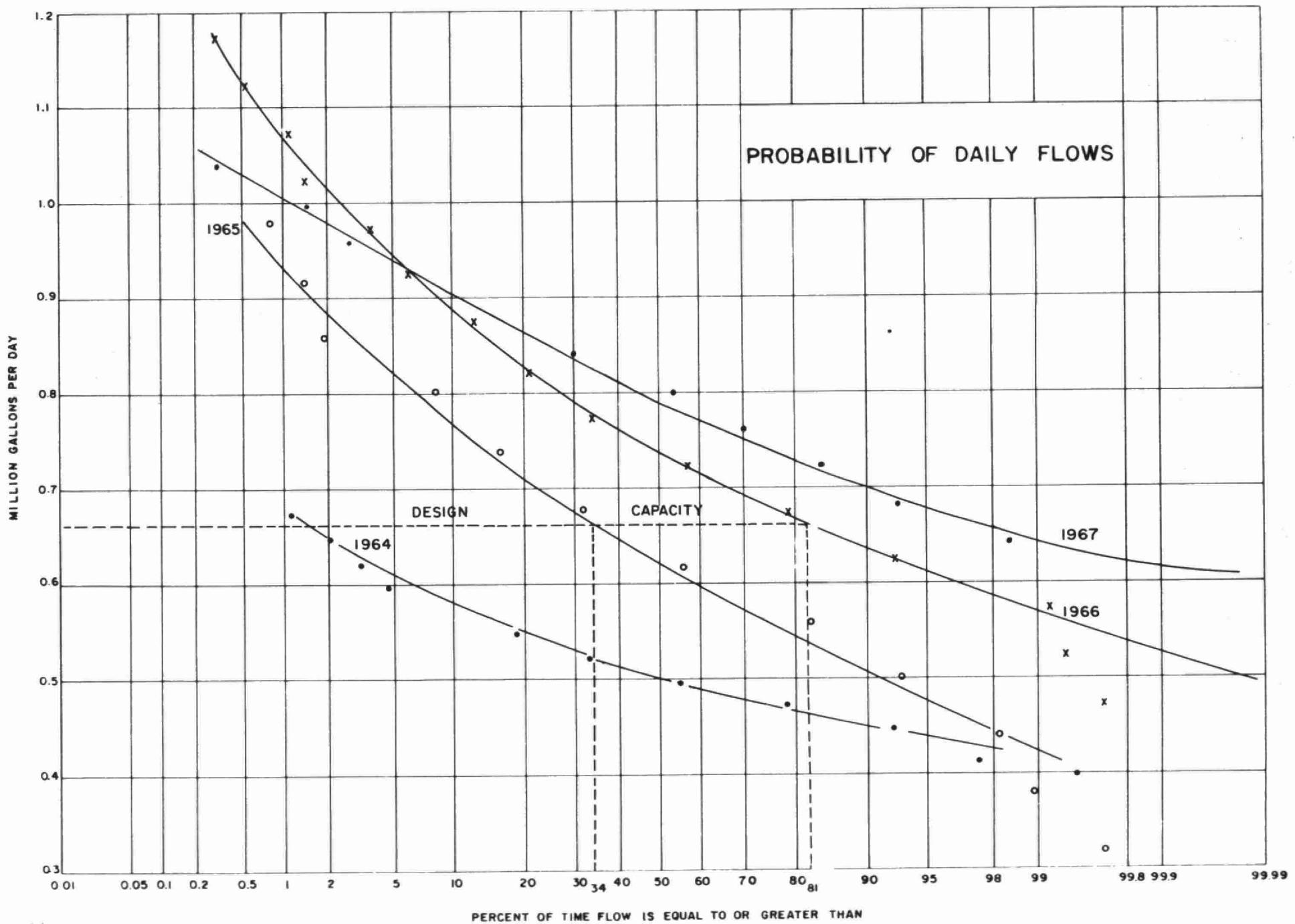
Process Data

A total of 277,327 million gallons of sewage was treated at the plant in 1967 as compared to 266,673 million gallons in 1966. The average daily flow was 760,000 gallons and represents 114% of the design capacity of the plant. This is an increase of 4.0%. The maximum average daily flow for a month occurred in January, when the flow was 844,000 gallons per day which represents 127% of the design capacity.

It should be noted that none of the recorded flows include the flows that are bypassed completely around the plant and meter during periods of high infiltration. Partial bypassing occurred on a total of 133 days during the year; however, the quantity could not be estimated.

From the probability graph it can be seen that during 1967, the design capacity of the plant was exceeded 97 percent of the time.

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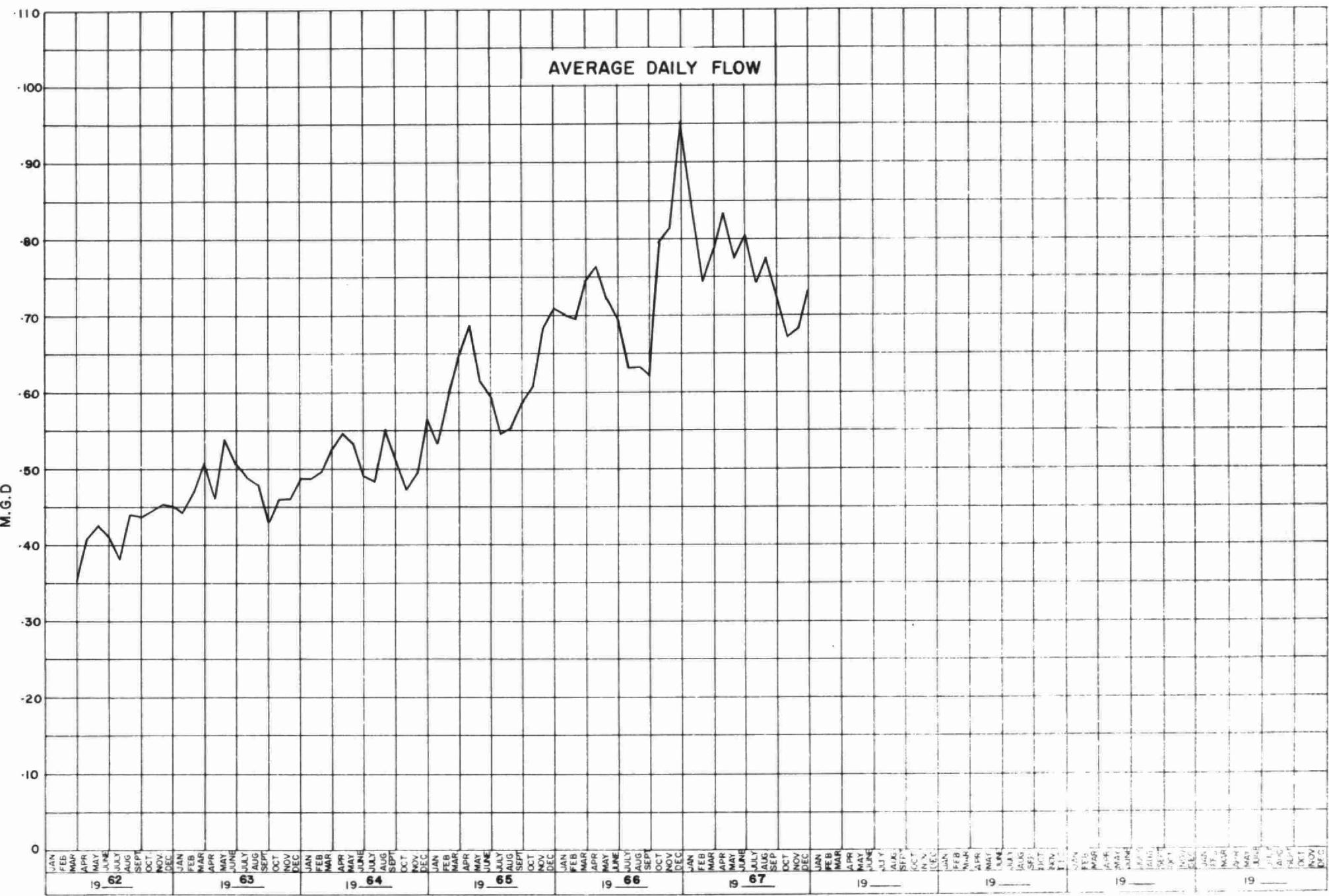
FLOW DATA

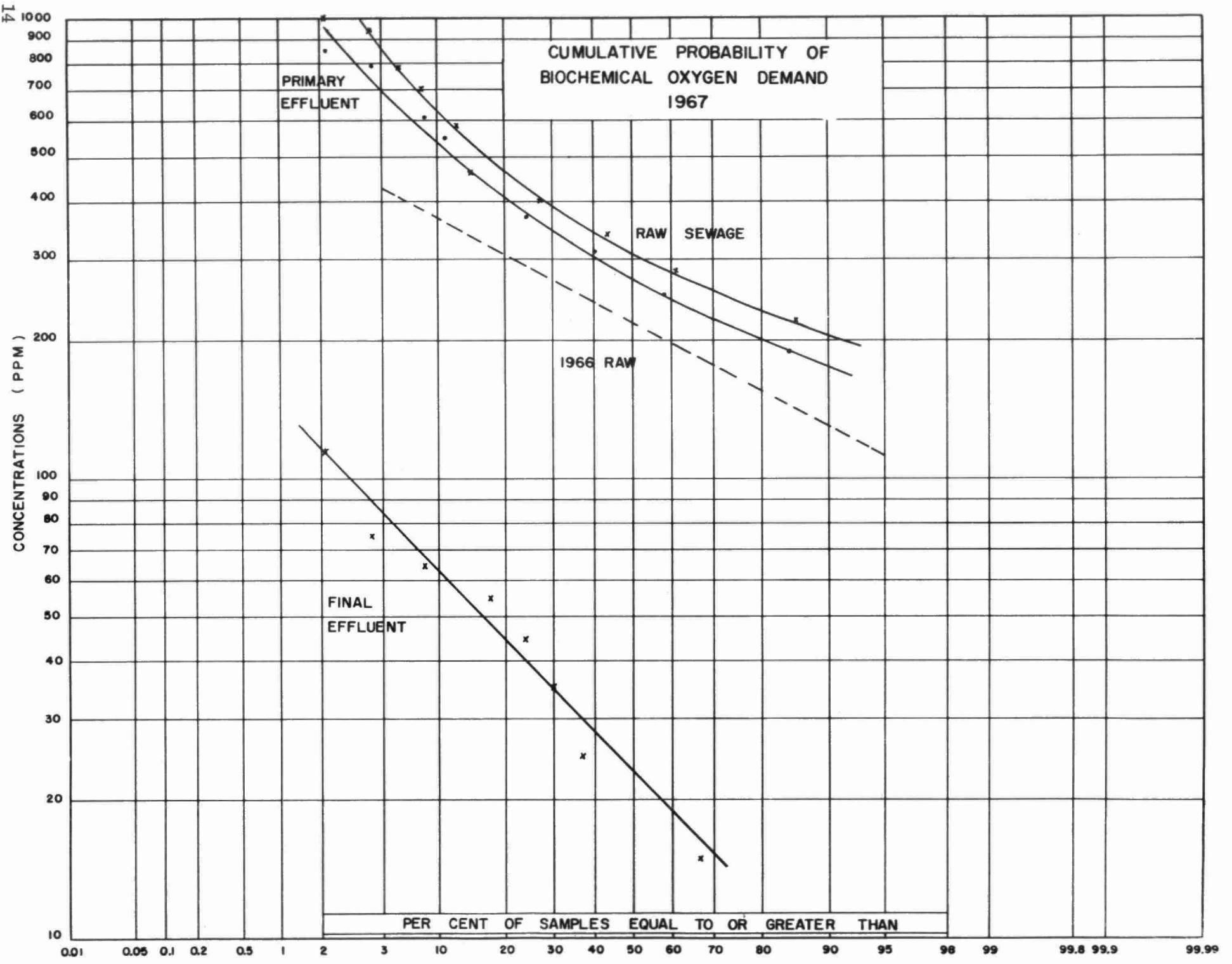
Month	Total Flow (MG)	Avg. Daily Flow (MGD)	Max. Daily Flow (MG)	Min Daily Flow (MG)	Max. Rate (MGD)
January	26.188	.844	.970	.592	1.750
February	20.867	.747	.929	.787	1.625
March	24.322	.785	.850	.640	1.625
April	24.983	.833	.941	.750	1.650
May	23.947	.772	.993	.601	1.700
June	24.189	.806	1.040	.714	1.700
July	23.075	.744	.805	.606	1.500
August	24.040	.775	.985	.682	1.500
September	21.656	.722	.793	.634	1.975
October	20.809	.671	.838	.586	1.425
November	20.487	.683	.816	.583	1.225
December	22.764	.734	.985	.580	2.020
Total	277.327				
Average	23.111	.760			

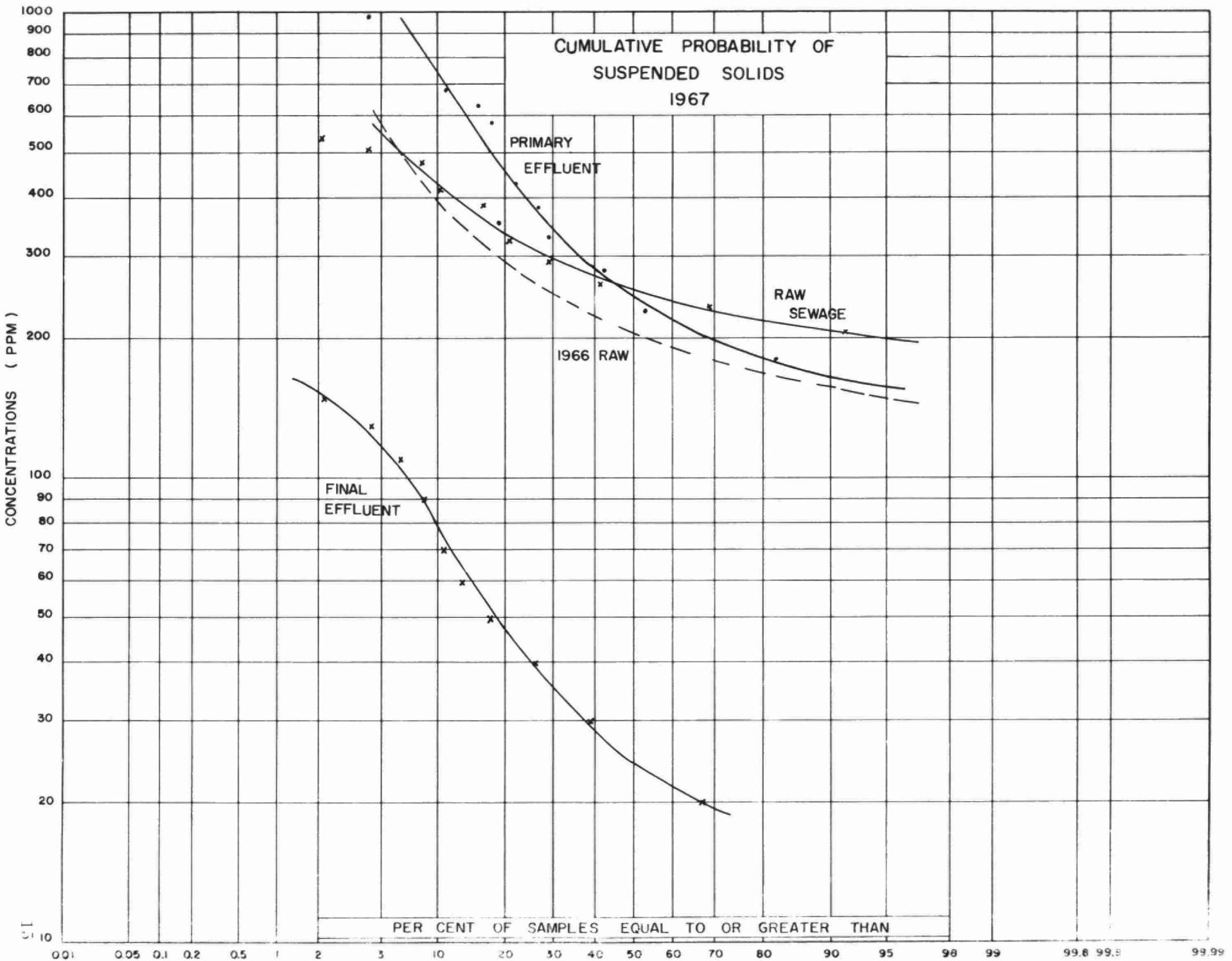
COMMENTS

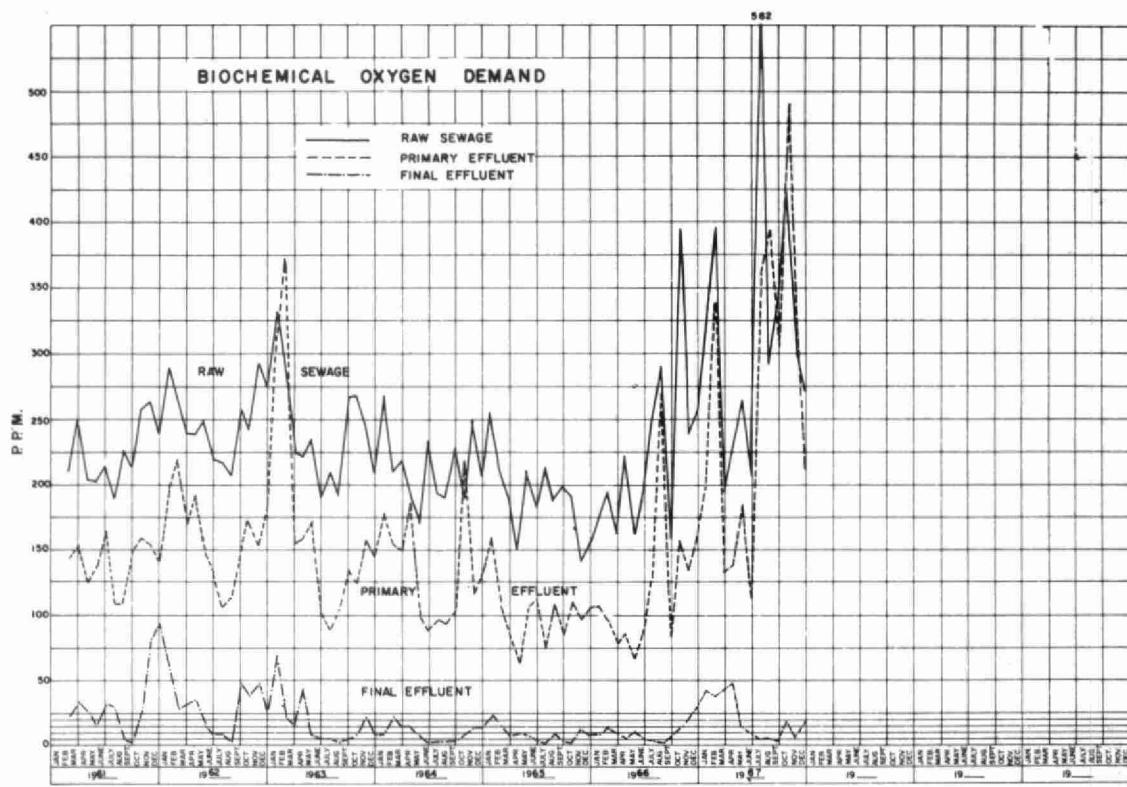
During 1967, the average monthly flow was never below the design value of 665,000 gpd. October and November were the only months that were only slightly over design on the average. The minimum day recorded was 580,000 gallons in December and the maximum day recorded, not including by-passed flows, was 1,040,000 gallons or 156% of the design flow.

AVERAGE DAILY FLOW

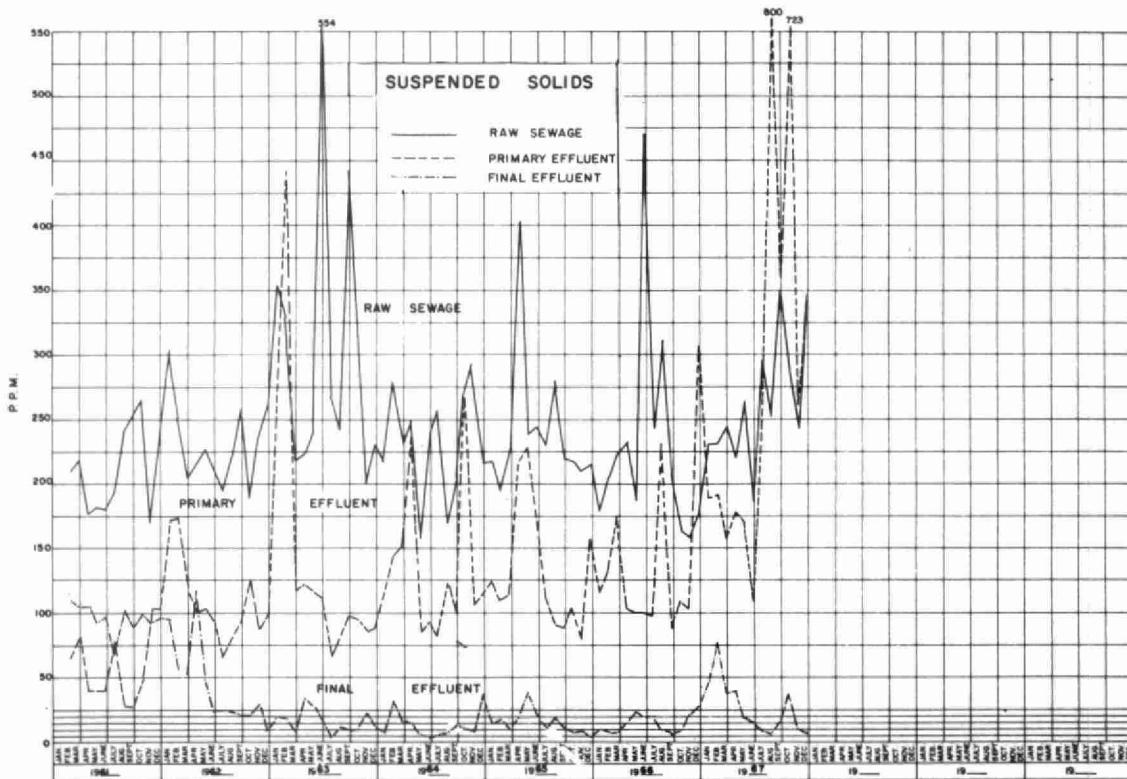








MONTHLY VARIATIONS



GRIT, B.O.D AND S.S. REMOVAL

MONTH	B. O. D.				S. S.				GRIT REMOVAL CU. FT.
	INFLUENT PPM.	EFFLUENT PPM.	% REDUCTION	TONS REMOVED	INFLUENT PPM.	EFFLUENT PPM.	% REDUCTION	TONS REMOVED	
JAN.	319	43	86.5	36.14	230	46	80.0	24.09	44
FEB.	396	38	90.4	37.35	232	76	67.2	16.28	32
MAR.	194	42	78.4	18.48	244	38	84.4	25.05	34
APR.	231	48	79.2	22.86	220	40	81.8	22.48	36
MAY	264	14	94.7	29.93	264	19	92.8	29.34	46
JUNE	206	9	95.6	23.83	186	15	91.9	20.68	59
JULY	562	5	99.1	64.26	296	9	97.0	33.11	44
AUG.	291	4.7	98.4	34.41	253	7	87.2	29.57	45
SEPT.	345	4.5	98.7	36.87	356	15	95.8	36.92	39
OCT.	421	18	95.7	41.93	288	39	86.6	25.96	38
NOV.	300	6.8	97.7	30.03	245	10	95.9	24.07	59
DEC.	270	16.8	93.8	28.82	336	8	97.6	37.33	53
TOTAL				404.91				324.88	529
Avg.	317	20.8	92.3	33.74	263	27	88.2	27.07	44

COMMENTS

A raw sewage having an average strength of 317 ppm BOD and 263 ppm SS was treated in 1967. The final effluent had an average strength of 20.8 ppm BOD and 27 ppm SS representing reductions of 92.3% and 88.2% respectively. The final effluent exceeded the OWRC objective of 15 ppm for BOD 70% of the time and the standard of 15 ppm for SS about 90% of the time. A total of 404.9 tons of BOD and 324.9 tons of SS was removed during the year. This is an increase of 123.6 tons of BOD and 40.9 tons of SS over the 1966 values.

The effluent quality results show the inability of the plant to treat the sewage now entering the plant. It should be noted that treatment was improved after April when modifications to the air diffusers were completed; however, the ability of the plant to cope with any additional load is limited.

The primary effluent had an average strength of 264 ppm BOD, representing a removal of only 16.8%.

The above results are based on eight-hour composite samples taken each week.

A total of 529 cu. ft. of grit was removed at an average of 44 cu. ft. per month. This represents a grit removal of 1.9 cu. ft. per million gallons of raw sewage.

AERATION SECTION

MONTH	PRIM. EFFL B.O.D. PPM.	M.L.S.S. PPM.	LBS. BOD. PER 100 LBS. M. L. S. S.	CUBIC FEET AIR PER LB. BOD. REMOVED
JANUARY	198	1717	35	962
FEBRUARY	337	1790	50	565
MARCH	133	1712	22	1909
APRIL	139	1891	22	1723
MAY	185	1435	40	969
JUNE	111	1465	22	1937
JULY	362	1903	50	839
AUGUST	395	2137	51	928
SEPTEMBER	302	1972	39	1160
OCTOBER	492	2389	49	697
NOVEMBER	311	1705	44	788
DECEMBER	210	1878	29	907
TOTAL				
AVERAGE	264	1833	38	1115

COMMENTS

The average BOD of the primary effluent to the aeration section was 264 ppm and the average MLSS was 1833 ppm resulting in an average loading of 38 lbs. of BOD per 100 lbs. MLSS. An average of 115 cu. ft. of air was supplied per pound of BOD removed.

In the fall of 1966 the air headers were partially converted to a cross-roll system which has markedly decreased blower use. The conversion of both aeration tanks was completed in May of 1967. This more efficient use of the air and increased BOD loadings have reduced the air required per pound of BOD removed from the 1966 average.

DIGESTER OPERATION

Month	Sludge to Digester Gallons	Sludge from Digester	
		Gallons	% Solids
January	439,487	56,944	2.22
February	378,729	64,527	
March	413,062	70,086	2.64
April	425,310	56,946	2.49
May	439,487	84,324	2.10
June	459,777	85,419	
July	500,237	85,419	
August	500,262	85,418	
September	486,060	85,419	
October	530,612	85,419	
November	494,160	84,323	1.89
December	502,262	71,184	
Total	5,569,445	915,428	
Average	464,120	76,286	2.27

COMMENTS

In 1967 an estimated 890,000 cu. ft. of raw sludge was pumped to the digester. A total of 147,000 cu. ft. of digested sludge at an average concentration of 2.27% was trucked away for disposal. This amounted to 16.4% of the raw sludge pumped to the digester or 19.5 cu. yd. per million gallons of raw sewage.

An additional 31,500 cu. ft. of raw sludge or its equivalent, 4.2 cu. yds., per million gallons of raw sewage was hauled without being treated by digestion due to the inability of the digester to handle this load effectively.

CHLORINATION

MONTH	PLANT FLOW (MG)	POUNDS CHLORINE	DOSAGE RATE (PPM)
JANUARY	26. 188	1548	5. 91
FEBRUARY	20. 867	1097	5. 25
MARCH	24. 322	1158	6. 14
APRIL	24. 983	1481	6. 14
MAY	23. 947	1345	5. 62
JUNE	24. 189	1321	5. 46
JULY	23. 075	1612	6. 99
AUGUST	24. 040	1644	6. 83
SEPTEMBER	21. 656	1540	7. 11
OCTOBER	20. 809	1458	7. 00
NOVEMBER	20. 487	1402	6. 84
DECEMBER	22. 764	1070	4. 70
TOTAL	277. 327	16676	
AVERAGE	23. 111	1390	6. 17

COMMENTS

The final effluent was chlorinated for the full year. A total of 16,676 pounds of chlorine was used at an average dosage of 6.17 ppm. The average chlorine residual was 0.5 ppm in the final effluent prior to being discharged into Otter Creek.

LABORATORY LIBRARY



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CONCLUSIONS

The flow to the plant has passed the point where plant expansion is absolutely necessary. This is indicated by the average daily flow for the year being 114% of the design flow and the average daily flow for the month of January being 127% of the design flow. In addition, the OWRC objectives are not being met 70% of the time for BOD removal and 90% for suspended solids removal.

RECOMMENDATIONS

Complete plans for the expansion of the plant, as prepared by the consulting firm of R. V. Anderson, should be implemented without further delay.

